

Research Of Formulation And Evaluation Of Face Serum Containing Flax Seed Gel

¹Miss. Ashwini BuddhiwanHiwale, ²Mr. Pawar R. K.

¹Student, L.N.B.C. Institute of Pharmacy, Satara

²Asst. Prof. L.N.B.C. Institute of Pharmacy, Satara

Submitted: 15-04-2023

Accepted: 25-04-2023

ABSTRACT

Facial wrinkles and skin aging are undesirable outcome of photodamage and ultraviolet (UV) rays. Currently no effective strategies are available to delay skin aging process. Flaxseed gel, glycerine and face serum is a highly concentrated cosmetic product. Serum has a property of rapid absorption and ability to penetrate into deeper layer of the skin. Flaxseed gel for the face works as an anti-aging gel and remove dead cells as well as moisturizer. Flaxseed gel fights dark spots and acne, vitamin E is an important fat-soluble Antioxidant and has been in use for more than 50 years in dermatology. It is an important ingredient in many cosmetic products. Vitamin E has been considered an anti-inflammatory agent in the skin, as several studies have supported its prevention of inflammatory damage after UV exposure vitamin E is a powerful antioxidant that may effective at reducing UV damage in skin. The face serum was evaluated for its physio-chemical parameters, pH, globule size, consistency. The stability study result showed that there was no change in visual appearance, homogeneity and globule size

KEYWORD :Cosmetic, moisturizer, anti-oxidant, anti-aging, anti-inflammatory, face serum

I. INTRODUCTION :

Serum is a concentrated product which widely used in cosmetology the name comes from itself in professional cosmetology. The cosmetic serum is a concentrated in water or oil as any other cream, serum or other concentrated product that contain ten times more organic matter than cream, therefore, deal with the cosmetic problem.

Quickly and effectively, serum is a skin care product that contains a gel or lightweight lotion Or moisturizer and has the ability to penetrate deep to bring the active ingredients to the skin. A good skin serum provide your skin a firmer, smoother texture, make pores appear smaller and increase moisture level.

all skin type needs these ingredients to be as healthy as possible. Gel and liquid preparation are best for oily and combination skin, serum and light lotion are best for normal to dry skin. Skin is a protective and largest organ of the body which is struggling heal and repair itself 24 hours, but sometime skin can develop dry patches for many reasons like UV rays, pollutant makeup left on overnight can cause irritation or allergic reactions. In this face serum flax seed gel for glowing skin it prevent drying of skin studies have found that fatty acids present in flax seed gel helps retain moisture, this makes the skin looks shiny and smooth. Then flax seed gel for skin elasticity, in that flax seed gel for face works as an anti-aging gel and removes dead cells and also fights dark spots and acne. Studies suggest that the alpha linolenic acid in the gel also manages oily skin and sebum production, which prevent acne.

Research shows that omega-three fatty acids present in this skin gel prevent it from drying and loosening they help the epidermis or the internal skin-layer retain water, making the skin look plumper, the gel also prevent wrinkles and fine lines on the face.

WHAT IS A SERUM?

“Serum are thin-viscosity topical product that contain concentrated amount of active ingredients Serum is lighter and delivers active ingredients to the skin quickly it goes on first, after you’ve cleansed your skin.

FLAXSEED GEL REDUCES SKIN SENSITIVITY :

Sensitive skin is more prone to inflammation and reactions. A 2011 Study shows that daily use of flax seed reduces this sensitivity. The poly-unsaturated fatty acid in the gel improves skin barrier function and increases the hydration of the skin. This also prevents skin damage from the sun's harmful UV rays.

FLAXSEED, OR LINSEED :



Linseed (*linum usitatissimum*), in the family Linaceae comes from the flax plant, which is an annual herb. Flax seed are a good source of dietary fiber and omega-3 fatty acids, including alpha-linolenic acid. Flax seed also contain phytoestrogens called lignans. The fiber in flax seed is found in the seed coat.

METHOD OF EXTRACTION :

Take water and add flax seed in the container let it heat for 3 to 4 minute and boil and keep stirring the mixture then turn off the flame when a white frothy gel like liquid emerges and let it cool for 20 to 30 minute, then use a thin cotton cloth to collect extract the gel from the flax seed mixture.

FORMULATION

MATERIALS AND METHOD :

Flax seed gel, Vitamin E, Glycerin, Almond Oil, Preservative, water

EMULSION PREPARATION :

Emulsion (o/w), was prepared as per the formula given below, oily phase consisting almond oil, vitamin E and emulsifier tween 20 mix well to get homogeneous solution. At the same time aqueous phase was prepared by mixing Flax seed gel, Glycerin and small quantity of distilled water homogeneously. The oily phase was added to aqueous phase drop by drop under mechanical stirring at 2500 rpm to get oil in water based biphasic emulsion.

FORMULA FOR FACE SERUM

SL.NO	INGREDIENTS	PERCENTAGE %
1	Flax seed gel	50%
2	Vitamin E	01%
3	Glycerin	25%
4	Almond oil	01%
5	Tween 20	1%
6	preservative	0.01%
7	Demineralize water	QS to 100 ml

EVALUATION

VISCOSITY :

Viscosity is determined by Ostwald Viscometer, when a layer of liquid is subjected to move upon a surface or another layer of the serum liquid, the fluid particles tend to oppose such Movement; this resisting force developed by a liquid is called viscosity.

COLOR AND APPEARANCE :

The color and appearance of the formulation (Flax seed gel face serum) was observed visually which appeared translucent white in color.

HOMOGENEITY :

The formulation prepared had even distribution of the extracts made. The homogeneity of the preparation was confirmed visually by the absence of any particulate matter and also feeling the product by touch.

PH OF THE SERUM :

A pH Of the serum is check by using pH Strip, in that the pH strip was dip into the serum then half second later, Take out The paper, using the color chart included, and was finally observed the color change of the paper.

GLOBULE SIZE DETERMINATION :

The prepared serum was properly analyzed under microscope to identify and confirm the globule size. One drop of the serum was placed on a glass slide and was diluted with water, it was covered with cover slip and was finally observed under microscope to determine globule size using stage micrometer.

SPREADABILITY :

Spreadability denotes the extent of area to which the gel readily spreads on application to skin or the affected part. The bio-availability efficiency of a cream also depends on its spreading value.

STABILITY STUDIES :

The formulation and preparation of any pharmaceutical or cosmetic product is incomplete without proper stability studies of the prepared formulation. This is done in order to determine the physical and chemical stability of the prepared product and thus determine the safety of the product under accelerated conditions, where the product is subjected to elevated temperatures and

moisture as per the ICH guidelines. A short term accelerated stability study was carried out for the period of 3 months for the prepared formulation. The samples were stored under the following conditions of temperature as 3-5°C, 25°C RH=60%, 40°C ±2% RH= 75%. The samples were withdrawn on monthly intervals and were analyzed for various parameters.

II. RESULT AND DISCUSSION :

Flax seed gel face serum formulation was light green viscous liquid preparation with a smooth homogeneous texture and glossy appearance. The formulation was re-dispersed within a seconds. After use, it felt like emollient, slipperiness and no residues were formed and easy to wash out.

PHYSICAL APPEARANCE :

Serum formulation was light green in color, viscous liquid preparation with a smooth homogeneous texture and glossy appearance.

VISCOSITY OF SERUM :

(part 1 :- determination of density of liquid)

1) Weight Of empty specific gravity bottle (W_1) = 14.78 g

2) Weight of specific gravity bottle + Distilled Water (W_2) = 24.07 g

3) Weight of specific gravity bottle + sample liquid (Flax seed serum) (W_3) = 24.72 g

Density of liquid [Flax seed serum]

$$\rho_2 = \frac{\text{Mass of liquid}}{\text{Mass of equal volume of water}}$$

$$\rho_2 = \frac{W_3 - W_1}{W_2 - W_1}$$

$$= \frac{24.72 - 14.78}{24.07 - 14.78}$$

$$= 9.94$$

$$9.29$$

$$= 1.06 \text{ g/ml}$$

Density of flax seed serum $[\rho_2] = 1.06 \text{ g/ml}$
 Density of water at room temperature $[\rho_1] = 0.997 \text{ g/ml}$ [this is the standard value of water at room temperature]
 [Part 2 - Determination of viscosity of liquid by Ostwald viscometer]

$$\text{Viscosity of liquid } [\eta_2] = \frac{\rho_2 t_2}{\rho_1 t_1} \times \eta_1$$

ρ_1 = Density of water [g/ml]
 ρ_2 = Density of test sample [flax seed serum]

η_1 = Viscosity of water [cp]
 η_2 = Viscosity of test sample [flax seed serum]
 t_1 = Mean time of flow of water from A to B
 t_2 = Mean time of flow of the sample [flax seed serum] from A to B
 Room temperature = 25°c
 Viscosity of water at room temperature = 0.8937 cp
 Density of flax seed serum $[\rho_2] = 1.06 \text{ g/ml}$ [we have calculated]
 Density of water at room temperature $[\rho_1] = 0.997 \text{ g/ml}$

OBSERVATION TABLE

LIQUID SAMPLE	TIME OF FLOW [SEC]			MEAN TIME[t] [SEC]	DENSITY [ρ][g/ml]	VISCOSITY [cp]
	1	2	3			
DISTILLED WATER	21.49	21.41	21.39	$t_1=21.43 \text{ sec}$	0.997 g/ml	0.8937 cp
FLAXSEED SERUM	111	110	115	$t_2= 112 \text{ sec}$	1.06 g/ml	4.967 cp

$$\begin{aligned} \text{Viscosity of liquid } [\eta_2] &= \frac{\rho_2 t_2}{\rho_1 t_1} \times \eta_1 \\ &= \frac{1.06 [112]}{0.997[21.43]} \times 0.8937 \\ &= \frac{118.72}{21.36571} \times 0.8937 \\ &= 4.967 \text{ cp} \end{aligned}$$

Viscosity of flax seed serum at room temperature is 4.967 cp.

pH :
 The pH of serum was found to be 7 as a neutral, as we have pH of 7 is suitable to skin for moisturizing purpose.

GLOBULESIZE DETERMINATION :
 The globule size was found to be in range of 0.1-0.3 μm . This range of particles enhance the penetration power of the formulation.

STABILITY STUDIES :
 The formulation was undertaken stability studies for physical and chemical change. No considerable variations in properties of the formulation were observed.

STABILITY STUDY OBSERVATIONS :

TEMPERATURE	EVALUATION PARAMETERS	OBSERVATIONS (Month)			
		0	1	2	3
3-5°C	Visual Appearance	Translucent White	Translucent White	Translucent White	Translucent White
	Phase Separation	Nil	Nil	Nil	Nil

	Homogeneity	Good	Good	Good	Good
Room Temperature (25°C RH=60%)	Visual Appearance	Translucent White	Translucent White	Translucent White	Translucent White
	Phase Separation	Nil	Nil	Nil	Nil
	Homogeneity	Good	Good	Good	Good
40°C±2°C RH=75%	Visual Appearance	Translucent White	Translucent White	Translucent White	Translucent White
	Phase Separation	Nil	Nil	Nil	Nil
	Homogeneity	Good	Good	Good	Good

AFTER FEEL :

The serum after distribution amongst individuals and their application, had a soothing and pleasant effect as informed to us by the individuals, indicating that it had an emollient and moisturizing action and also it was non-irritating and non-sensitive to the skin.

III. CONCLUSION :

The aim of the study was to formulate different herb into a serum for moisturizing and glowing activity on skin. Cosmeceuticals are skin-care products that cater for both cosmetics and drugs. In this serum flax seed gel was used. Flax seed contain antioxidants, anti-inflammatory agents, and fiber. All these compounds promote healthy skin and help to treat acne. Fibers increase collagen level in the skin to promote the formation of new cells. Flax seed can also reduce hormonal acne due to their estrogen-regulating properties. It contain antioxidants that help prevent the onset of wrinkles and saggy skin. The fatty acids present in flax seeds also play a role in smoothing the skin. Flax seed help boost collagen levels in the skin due to their fatty acid and antioxidant content, making your skin firm and youthful. Flax seed contain nutrients that rejuvenate the skin. The anti-inflammatory properties of flax seeds help soothe skin irritation and itchiness. Flax seed are excellent moisturizers due to their omega-3 fatty acid content. these fatty acids help seal in moisture in the skins upper layer, giving you soft and smooth skin. Flax seeds contain a large amount of antioxidants that help protect your skin from free radical damage caused by sun exposure. They also contain omega-3 fatty acids that help prevent UV damage to the skin.

REFERENCES

- [1]. Budiasih, S. M. (2018). Formulation and characterization of cosmetic serum containing argan oil as moisturizing agent. SCITEPRESS- Science and technology publications, 297-304.
- [2]. butler, K. &. (n.d.). Science explains the benefits of flax seeds for your skin. Retrieved from power of positivity:<https://www.powerofpositivity.com/flax-seeds-skin-benefits/#:~:text=Science%20Explains%20The%20Benefits%20Of%20Flax%20Seeds%20For,Rosacea%2C%20Eczema%2C%20Psoriasis.%206%20...%20%28more%20items%29%20>
- [3]. Chatur, V. M. (2021). Formulation and physical characterization of herbal face gel toner. World Journal of Advanced research and reviews, 138-145.
- [4]. Chaugule, A. (2022). Formulation and evaluation of protective role of flaxseed gel in hair growth, nourishment and anti-dandruff activity. Journal of emerging technologies and innovative research , 272-278.
- [5]. D.Manjula, J. J. (n.d.). Formulation and evaluation of flaxseed gel. Retrieved from Journal Article: <http://www.ijrpc.com/files/5-7-18/12.pdf>
- [6]. Drake, V. J. (n.d.). Essential fatty acids and skin health. Retrieved from Oregon state university: <https://ipi.oregonstate.edu/mic/health-disease/skinhealth/essential-fatty-acids#lipid-metabolism8>)Kanchan

- Chande, S. D. (2014). Formulation and evaluation of anti aging serum. *Journal of emerging technologies and innovation research*, 494-502.
- [7]. Han, H. (2018). Antioxidant activity of flaxseed shell and analysis of its polyphenol contents. *ACG Publications*, 397-402.
- [8]. O. A. Jabbar, B. M. (2018, July 10). The effect of flaxseed extract on skin elasticity of the healing wound in rabbits. Retrieved from Semantic scholar: <https://www.semanticscholar.org/paper/The-Effect-of-Flaxseed-Extract-on-Skin-Elasticity-Jabbar-Mustafa/fc2cfd6a81601e5a06d1a133ee13c5dafa636f73>
- [9]. Patil, T. (2022). Formulation and evaluation of anti-aging face serum spray. *International journal of creative research thoughts* , 488-494.
- [10]. Rajdev, P. S. (2022). Formulation and evaluation of face serun. *International journal of advanced research in science, communication and technology*, 255-259.
- [11]. Richelle S. McCullough, A. L. (2011, Oct 27). The alpha linolenic acid content of flaxseed is associated with an induction of adipose leptin expression. Retrieved from lipids springer: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3213345/#_ffn_sectitle
- [12]. sanghvi, A. s. (2022, January 21). Benefits of using flaxseed for skin. Retrieved from eMedihealth: <https://www.emedihealth.com/skin-beauty/flaxseeds-benefits-skin-hair>
- [13]. Sasidharan, S. (2014). Formulation and evaluation of fairness serum using polyherbal extract . *International journal of pharmacy* , 105-112.
- [14]. seelam, r. (2020, July 31). Benefits of flaxseed on skin and hair. Retrieved from Mantra organic : <https://www.24mantra.com/blogs/organic-lifestyle/10-benefits-of-using-flaxseed-on-skin-and-hair/>
- [15]. Smriti Ojha, S. S. (2019). Formulation and evaluation of face serum containing Bee Venom and aloe vera gel. *World journal of Pharmaceutical research*, 1100-1105.
- [16]. Tamsheel Fatima Roohi, a. A. (2021). Phytochemical evaluation and standardization of polyherbal ethyl acetate extract and its gel-based formulation obtained from berries and flaxseed. *International journal of pharmaceutical science and research*, 5010-5017.
- [17]. Waszkowiak, K. (n.d.). Protein fractions from flaxseed: the effect of subsequent extractions on composition and antioxidant capacity . Retrieved from MDPI: <https://www.mdpi.com/2076-3921/12/3/675>
- [18]. William Montagna, F. J. (n.d.). Human skin. Retrieved from Britannica: <https://www.britannica.com/science/human-skin>
- [19]. Yasmeen, M. (2018). A review of phytochemicals and use of flaxseed. *International journal of chemical and biochemical science*, 70-75.